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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/245,168	02/05/1999	VINCENT K. JONES	CISCP604	4595

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EXAMINER

HOM, SHICK C

ART UNIT	PAPER NUMBER
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2666

DATE MAILED: 12/30/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/245,168

Applicant(s)

JONES ET AL.

Examiner

Shick C Hom

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,9-16 and 22-25 is/are rejected.
- 7) ☒ Claim(s) 4-8 and 17-21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 10/25/02 have been fully considered but they are not persuasive.
2. Applicant's arguments with respect to claims 1-25 have been considered but are moot in view of the new ground(s) of rejection.

Specification

3. The disclosure is objected to because of the following informalities: in page 2 lines 1-2 update status of co-filed application 09/244,754 if known.

Appropriate correction is required.

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

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Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371[®] of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 1, 2, and 12-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Schmidl et al.

Schmidl et al. disclose all the subject matter now claimed. Note Fig. 1 which shows a OFDM transmitter and col. 1 line 39 to

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col. 2 line 22 which recite transmitting OFDM signal whereby the OFDM transmitter receives a stream of baseband data bits as its input which are fed into an encoder, the encoder performs 2^m -ary quadrature amplitude modulation QAM encoding of the $2N$ sub-segments of m bits in order to create a sequence of frequency-domain sub-symbols that encodes the B data bits and then passes the sequence of sub-symbols, along with any additional zeroes that may be required for interpolation to simplify filtering, onto an inverse fast Fourier transformer IFFT wherein upon receiving the sequence of OFDM frequency-domain sub-symbols from encoder, IFFT performs an inverse fast Fourier transform on the sequence of sub-symbols thereby producing a digital time-domain OFDM symbol clearly anticipate the method for transmitting OFDM signal including the step of transforming frequency domain data symbols into time domain symbols and transmitting the time domain burst as in claims 1 and 12-14. Col. 2 lines 38-47 which recite the digital time-domain OFDM symbols produced by IFFT being passed to a digital signal processor DSP which performs additional spectral shaping on the digital time-domain OFDM symbols and also adds a cyclic prefix or guard interval of length T_g to each symbol whereby the cyclic prefix is a repetition of part of the symbol wherein this cyclic prefix is typically longer

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than the OFDM channel impulse response and therefore, acts to prevent inter-symbol interference ISI between consecutive symbols clearly anticipate the step of appending to the beginning of the time domain burst a cyclic prefix duplicating the last segment of the burst and having a length greater than or equal to the impulse response of the channel as in claims 1 and 12. Col. 11 line 60 to col. 12 line 15 which recite the method for facilitating timing and frequency synchronization of a receiver to an OFDM signal which relies on the detection and analysis of a special OFDM training sequence that is included in the OFDM signal transmitted within a data frame clearly anticipate the method to facilitate receiver synchronization including the step of appending a second portion after the cyclic prefix to facilitate receiver synchronization as in claims 1 and 12. Fig. 2 which shows the periodically spaced frequency domain symbols having null energy and col. 2 lines 23-36 which recite purpose of spacing each of the $2N+1$ sub-carriers $1/T_s$ apart in the frequency domain, so that the primary peak of each sub-carrier's sinc x spectrum coincides with a null of the spectrum of every other sub-carrier so that although the spectra of the sub-carriers overlap, they remain orthogonal to one another and the modulated sub-carriers fill the OFDM channel bandwidth very

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efficiently clearly anticipate the step of developing a frequency domain burst wherein periodically spaced frequency domain symbols have values including non-zero values and frequency domain symbols between the periodically spaced frequency domain symbols have null energy and transmitting the frequency domain burst as in claims 2 and 14-15.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly

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owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103[®] and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 3, 9-11, 16, and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidl et al. as applied to claims 1, 2, and 12-15 above, and further in view of Barratt et al.

Schmidl et al. did not teach the step of evaluating a cost function that varies depending on burst timing alignment and setting the timing alignment to optimize the cost function as in claims 3, 9-11, 16, and 22-25.

Barratt et al. teach that it is known to provide a method for generating a reference signal transmitted from a remote station to a communications station used for time alignment at the receiver whereby the cost function is minimized using the received signals and the reference signal as set forth at col. 6 line 63 to col. 7 line 22 and col. 11 lines 24-45 in the field of digital and multiplex communications for the purpose of providing a more cost effective system operation which clearly anticipate

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the step of evaluating a cost function that varies depending on burst timing alignment and setting the timing alignment to optimize the cost function.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the step of evaluating a cost function that varies depending on burst timing alignment and setting the timing alignment to optimize the cost function as taught by Barratt et al. to the system of Schmidl et al. because Barratt et al. teach the desirable advantage of providing a more cost effective system operation by varying timing alignment in Schmidl et al.

Allowable Subject Matter

9. Claims 4-8 and 17-21 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Marchok et al. disclose an apparatus and method for symbol alignment in a multi-point OFDM or DMT digital communications system.

11. **Any response to this nonfinal action should be mailed to:**

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 872-9314, (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal
Park II, 2121 Crystal Drive, Arlington. VA., Sixth
Floor (2600 Receptionist at (703) 305-4750).

Any inquiry concerning this communication or earlier
communications from the examiner should be directed to Shick Hom
whose telephone number is (703) 305-4742. The examiner's regular
work schedule is Monday to Friday from 8:00 am to 5:30 pm EST and
out of office on alternate Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao, can be reached at (703) 308-5463.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

SH



December 29, 2002